

2000 FEDERAL ENERGY AND WATER MANAGEMENT AWARD NOMINATION

Location: Savannah River Site, Aiken, SC.

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Project: Line Item Chiller Replacement

NARRATIVE

The Savannah River Site (SRS) is a 300 square mile DOE-owned facility with Westinghouse Savannah River Company (WSRC) operating as the prime contractor. In 1993 WSRC formed committees to address Clean Air Act regulations concerning the phaseout of chlorofluorocarbon (CFC) refrigerants. In 1994 the SRS Refrigerant Management Plan was developed outlining specific actions necessary for the CFC phaseout at the site. In 1995 the first group of 51 individual refrigeration equipment that utilize CFC refrigerants was replaced. One of the benefits of phasing out the aged CFC equipment is improved energy efficiency. In 1999 the Line Item Chiller Replacement Project Team completed three subprojects that replaced 12 inefficient CFC chillers with 9 new efficient non-CFC units.

The resulting benefits of the Line Item Chiller Replacement Project to the U.S Government are:

- protection of stratospheric ozone by meeting CFC emission reduction goal set by Executive Order 12856 three years early,
- operation cost reductions due to phaseout of scarce and costly CFC refrigerants,
- operation cost reductions due to installation of more energy efficient chillers,
- operation/maintenance cost reductions due to installation of state-of-the-art refrigeration equipment, and
- improved refrigerant accountability for environmental stewardship.

In 1999 Project S-6016 constructed a new central chilled water facility for F-Area serving buildings 221-F (Worthington system), 772-F, and 772-1F (see attached photograph). The facility consists of four 750-ton York centrifugal R-123 chillers and a new cooling tower. This plant replaces a total of seven individual R-11 chillers located in the above mentioned buildings. The facility is expected to yield over \$2M in life cycle cost savings and reduces CFC usage by approximately 3000 lbs/yr. The annual energy savings due to improved chiller efficiencies and the consolidated chiller arrangement are approximately 7.02E09 BTU/yr and \$125K/yr.

In 1999 Phase III of Project S-5533 replaced two R-11 chillers located in 249-H that served the Replacement Tritium Facility, 233-H. The new chillers are York R-123 chillers, and they are expected to yield over \$300K in life cycle cost savings and reduce CFC usage by approximately 320 lbs/yr. The annual energy savings due to improved chiller efficiencies are approximately 1.2E09 BTU/yr and \$22K/yr.

In 1999 Project S-6056 replaced three R-11 chillers located in 235-1F and 235-2F that served the Metallurgical Building, 235-F. The new chillers are McQuay R-134a chillers, and they are expected to reduce CFC usage by approximately 800 lbs/yr. The annual energy savings due to improved chiller efficiencies are approximately

1.29E09 BTU/yr and \$23K/yr.

The total expected annual energy and cost savings from these three subprojects are 9.51E09 BTU/yr and \$170K/yr, respectively. The estimated savings in FY99 were 4.78E09 BTU and \$85K.

SUMMARY

In 1999 the Savannah River Site (SRS) Line Item Chiller Replacement Project Team completed three subprojects that replaced 12 inefficient and ozone-depleting chlorofluorocarbon (CFC) chillers with 9 new efficient non-CFC units. The subprojects will yield significant environmental and cost benefits. The total expected annual energy and cost savings from these three subprojects are 9.51E09 BTU/yr and \$170K/yr, respectively. The estimated savings in FY99 were 4.78E09 BTU and \$85K.